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While the secondary minimum was not observed in U *Coronae*, the spectroscopic observations show the spectrum of the second component, both being of the same type B5. Consequently the fourth of Shapley's orbits which assumes the brighter star as giving seventy-four per cent of the light of the system was taken as the most likely, altho little difference in the results, except to increase the ratio of surface intensities, would be given by using any of the other orbits. The fainter star has sixty per cent greater radius, a density one-twelfth and a surface intensity only about one-eighth that of the brighter, while the spectral types are the same.

While it is desirable to have more accurate photometric observations and orbits of these two stars, there can be no reasonable doubt of the substantial accuracy of the relative surface intensities and densities of the components. From these two cases and from those of other eclipsing variables, it would appear as if the surface intensity was not solely a function of the spectral type but had also some relation to the density. In eclipsing variables the star of smaller density has also the smaller surface intensity while in the visual binary *Sirius*, whatever reasonable assumptions are made of the value of the density and surface intensity, the fainter component of lower brightness per unit area must have the higher density. While it is true that the conditions in eclipsing variables and visual binaries are very different and while it is possible these systems may have had a different origin and mode of development, it is evident that, until more information is available, considerable caution must be used in assuming that the surface intensity of two stars of the same spectral type is the same.

J. S. Plaskett.

The Nebulous Disk Surrounding Nova Aquilae, No. 3

In an earlier note[1] I described *Nova Aquilae*, No. 3, as it appeared in the 36-inch telescope in August-September, 1919, and gave measures of the diameter ($2''.37$) of the nebulous disk[2] which surrounded the nucleus. At that time I called attention to the apparent increase in the size of this disk in the interval since October, 1918, when Barnard's measures gave a diameter of $0''.65$.

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[1] *Publ. A. S. P.*, **31**, 283, 1919.

[2] The term *disk* in this note is used to describe the image of the nova, which is in focus when the eye-piece is drawn out 8 mm. beyond the normal stellar focus. According to Keeler's color-curve of the 36-inch lens, light of wavelength λ 4980 is brought into focus at this point. The N_1 and N_2 lines of nebulium have wavelengths λ 5007 and λ 4959 respectively.

I have re-examined the nova and made measures of the disk on two nights in the present season, June 7th and July 5th, using a 1000-power eyepiece. At the normal stellar focus the nucleus appeared as sharp as an ordinary star of the same magnitude, but it was surrounded by a halo not seen about an ordinary star. This, of course, was due to the out-of-focus light from the nebulous envelop of the nova, and when the eyepiece was drawn out 8 mm. beyond stellar focus it condensed into a small circular disk of bluish-green color. The nucleus was now out of focus and was completely lost in the light of the nebulous envelop, which, as the spectrograms show, is concentrated almost entirely into the N_1 and N_2 lines (or rather bands) of nebulium—the so-called "green" nebular lines. But the disk, while having the same general appearance as a year ago, was fainter and larger, my measures on the two nights giving $3''.69$ and $3''.58$, respectively, for the diameter. These values agree well with the results of Barnard's measures of the "close bright glow" about the star on June 12th and July 8th, the mean of his measures being $3''.55$ and the mean of my measures of the disk $3''.63$. The fact that the envelop has expanded during the past year is fully substantiated by the spectrograms which are described by Dr. Moore on another page.

Professor Barnard has probably kept a closer watch upon this nova than any other observer and his article, also printed in the present number of these PUBLICATIONS, is of great interest.

July 15, 1920. R. G. AITKEN.

RECENT SPECTROGRAPHIC OBSERVATIONS OF NOVA AQUILAE III

Spectrograms of *Nova Aquilae* III have recently been secured (May 23-June 11, 1920) with a one-prism spectrograph and the 36-inch refractor, on which the N_1, N_2 and $H\beta$ bands have the peculiar sinuous form, observed in the spectrum of this object in the summer of 1919,[1] by Messrs. Wright, Moore and Shane. Maximum and minimum sinuous effects in the bands are obtained, as last year, when the slit of the spectrograph is placed centrally across the nova disk in position angles respectively 202° and 112°.

Several conspicuous changes appear to have occurred in the bands since the observations of last year. They are noticeably wider in a direction at right angles to the length of the spectrum,

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[1] *L. O. Bull.*, **10**, 30 and 32, 1919.
Publ. A. S. P., **31**, 269, 1919.